

II. Listing of the Claims:

1. (Currently amended): A torque controller to control output power to at least two shafts, said the torque controller comprising:

a differential having at least a first and a second output shaft, ~~each output shaft having an interface to a transfer assembly;~~

at least a first and a second transfer assembly, said transfer assemblies connected to each interface and to the differential;

at least a first and second interface, said first interface being mounted between and interconnecting said first output shaft and said first transfer assembly and said second interface being mounted between and interconnecting said second output shaft and said second transfer assembly, said interfaces being adapted to transfer and redirect rotational motion between said output shafts and said transfer assemblies;

a torque difference source connected to each transfer assembly, wherein said the first output shaft and said first transfer assembly receive work from said the differential, and said the second transfer assembly and said second output shaft receive work from said the torque difference source, said torque difference source being adapted to provide a selectively engageable link between said first and second transfer assemblies and thereby, said first and second output shafts such that rotation of one of said output shafts relative to the other of said output shafts will be selectively transferred through said torque difference source between said first and second output shafts; and

at least two sensors, said sensors being adapted to measure wheel slip and thereby the relative power output of said first and second output shafts; and

a an electronic controller controllably connected to the adapted to receive a signal from said sensors and to selectively actuate said torque difference source and said the transfer assemblies, the controller receiving inputs from at least two sensor indicative of the output power of the shafts based upon said signal.

C 2. (Currently amended): The torque controller of Claim 1, wherein the amount of work from said the second transfer assembly and said second output shaft is less than or equal to greater than the amount of work from said the first transfer assembly.

3. (Original): The torque controller of Claim 1, wherein the torque difference source comprises a pump and each transfer assembly comprises a gear train.

4. (Withdrawn): The torque controller of Claim 1, wherein the torque difference source comprises a generator and each transfer assembly comprises a gear train.

5. (Withdrawn): The torque controller of Claim 1, wherein the torque difference source comprises a compressor and each transfer assembly comprises a gear train.

6. (Cancelled).

7. (Original): The torque controller of Claim 1, further comprising means for controlling the output of the torque difference source.

8. (Original): The torque controller of Claim 7, wherein the means is selected from the group consisting of a source of electrical power, a source of hydraulic power, and a source of pneumatic power.

c 9. (Original): A method of transferring power from a first shaft output in a differential to a second shaft output, the method comprising:

providing power to a differential;

sensing a difference in shaft output power application;

determining whether a correction in output power is needed;

routing power from the first shaft output to a torque difference source;

routing power from the torque difference source to a second shaft; and

continuing to sense shaft output power.

10. (Original): The method of Claim 9, further comprising measuring the difference in shaft output power application.

11. (Original): The method of Claim 9, further comprising converting power from the first shaft and converting power for routing to the second shaft.

12. (Original): The method of Claim 11, wherein converting power from the first shaft is selected from the group consisting of converting mechanical power to electrical power, converting mechanical power to pneumatic power and converting mechanical power to hydraulic power.

13. (Original): The method of Claim 11, wherein converting power for routing to the second shaft is selected from the group consisting of converting electrical power to mechanical power, converting pneumatic power to mechanical power, and converting hydraulic power to mechanical power.

14. (Previously Presented): A torque controller to control output power to two shafts, the torque controller comprising:

a differential having a first and a second output shaft, the first output shaft having an interface to a first transfer assembly and the second output shaft having an interface to a second transfer assembly;

a torque difference source connected to the first and second transfer assemblies;

means for controlling power applied by the first shaft and transfer assembly to the torque difference source and for controlling power applied by the torque difference source to the second shaft and transfer assembly; and

means for measuring power in the first and second shafts.

15. (Cancelled).

16. (Previously Presented): The torque controller of Claim 14, wherein the means for measuring power are selected from the group consisting a wheel speed sensor, a shaft speed sensor, a flow sensor, a pressure sensor, an ammeter, a voltage sensor, a steering angle sensor and a yaw rate sensor.

17. (Original): The torque controller of Claim 14, further comprising means for monitoring power applied by the first shaft and transfer assembly to the torque difference source and by the torque difference source to the second transfer assembly and shaft.

18. (Original): The torque controller of Claim 14, wherein the means for monitoring power are selected from the group consisting of a computer, a microprocessor, a digital signal processor, an engine electronic controller, an engine control unit, a brake controller, an anti-lock brake controller, and a traction control system.

19. (Original): The torque controller of Claim 14, wherein the torque difference source is selected from the group consisting of a generator, a pump and a compressor.

20. (Original): The torque controller of Claim 14, wherein the first and second transfer assemblies are gear trains.

21. (Withdrawn): A torque controller to control output power to a first shaft and a second shaft, the torque controller comprising:

an automotive differential having first and second shaft outputs;

a first transfer assembly connected to said first shaft output and a second transfer assembly connected to said second shaft output, wherein the first and second transfer assemblies comprise a speed-up gear train;

a generator having a first rotor and a second rotor, the rotors of the generator connected to the first and second transfer assemblies; and

a controller, connected to the first and second transfer assemblies and receiving signals indicative of a speed of the first and second shafts,

wherein the first shaft and first transfer assembly do work and the second transfer assembly and second shaft have work done when the first shaft speeds up, and wherein the second shaft and the second transfer assembly do work and the first shaft and first transfer assembly have work done when the second shaft speeds up.

22. (Withdrawn): The torque controller of Claim 21, wherein the first and second transfer assemblies do work by spinning the first and second rotors of the generator, and wherein the first transfer assembly has work done when the second rotor speeds up the first rotor and the first shaft, and the second transfer assembly has work done when the first rotor speeds up the second rotor and the second shaft.

23. (Previously Presented): A torque controller to control output power to a first shaft and a second shaft, the torque controller comprising:

an automotive differential having first and second shaft outputs;

a first transfer assembly connected to said first shaft output and a second transfer assembly connected to said second shaft output, wherein the first and second transfer assemblies comprise a speed-up gear train;

a pump having a first rotor connected to the first transfer assembly and a second rotor connected to the second transfer assembly; and

a controller connected to the pump receiving signals indicative of a speed of the first and second rotors,

wherein the first shaft and first transfer assembly transfer work and the second transfer assembly and second shaft receive work when the first shaft speeds up, and wherein the second shaft and the second transfer assembly transfer work and the first shaft and first transfer assembly receive work when the second shaft speeds up.

24. (Previously Presented): The torque controller of Claim 23, wherein the first transfer assembly and first rotor transfer work by spinning the first rotor of the pump, and the second rotor and second transfer assemblies transfer work by spinning the second rotor of the pump, and wherein the first transfer assembly receives work when the second rotor speeds up the first rotor, and wherein the second transfer assembly receives work when the first rotor speeds up the second rotor.

25. (Original): The torque controller of Claim 23, wherein the pump is selected from the group consisting of a gear pump, a centrifugal pump, a gerotor pump, a vane pump, and a hydraulic pump.

26. (Withdrawn): A torque controller to control output power to a first shaft and a second shaft, the torque controller comprising:

an automotive differential having first and second shaft outputs;

a first transfer assembly connected to said first shaft output and a second transfer assembly connected to said second shaft output, wherein the first and second transfer assemblies comprise speed-up gear trains;

a compressor having a first rotor connected to the first transfer assembly and a second rotor connected to the second transfer assembly; and

a controller connected to the first and second transfer assemblies and receiving signals indicative of a speed of the first and second rotors,

wherein the first shaft and first transfer assembly do work and the second transfer assembly and second shaft have work done when the first shaft speeds up, and wherein the second shaft and the second transfer assembly do work and the first shaft and first transfer assembly have work done when the second shaft speeds up.

27. (Withdrawn): The torque controller of Claim 26, wherein the first and second transfer assemblies do work by compressing air, and wherein the first transfer assembly has work done when the second rotor speeds up the first rotor,

and wherein the second transfer assembly has work done when the first rotor speeds up the second rotor.

28. (Withdrawn): The torque controller of Claim 26, wherein the compressor is selected from the group consisting of a centrifugal compressor, a vane compressor, an axial compressor, a rotary compressor, and a screw-type compressor.

29. (New): A torque controller adapted to control comprising:

C/ a differential having first and second output shafts extending therefrom, each of said first and second output shafts having an interface mounted thereon;

a first transfer assembly and a second transfer assembly, said first transfer assembly engaging said interface of said first output shaft and said second transfer assembly engaging said interface of said second output shaft such that rotational motion is transferred and redirected between said first output shaft and said first transfer assembly and said second output shaft and said second transfer assembly;

said transfer assemblies each including a gear train adapted to change the ratio of speed between said transfer assembly and said output shafts to either speed up or slow down the rotation transferred therebetween;

a torque difference source positioned between and interconnection said first and second transfer assemblies, said torque difference source including an inner rotor and an outer rotor, said outer rotor engaging said first transfer assembly such that rotational motion is transferred between said first output shaft and said outer rotor through said first transfer assembly, said inner rotor engaging said second

transfer assembly such that rotational motion is transferred between said second output shaft and said inner rotor through said second transfer assembly,

a power source adapted to provide electrical power to said inner and outer rotors, thereby generating a reluctance and inducing drag between said inner and outer rotors;

at least two sensors, said sensors being adapted to measure the difference in rotational speed of said first and second output shafts and thereby the relative power output of said first and second output shafts; and

an electronic controller adapted to receive a signal from said sensors and to selectively actuate said power source to provide electrical power to said inner and outer rotors.

30. (New): The torque controller of claim 29 wherein said sensors are positioned to directly measure the rotational speed of said first and second output shafts.

31. (New): The torque controller of claim 29 wherein said sensors are positioned to measure the rotational speeds of said inner and outer rotors, said controller being adapted to calculate the relative rotational speeds of said output shafts from the rotational speeds of said inner and outer rotors.

32. (New): A torque controller adapted to control comprising:
a differential having first and second output shafts extending therefrom, each of said first and second output shafts having an interface mounted thereon;

a first transfer assembly and a second transfer assembly, said first transfer assembly engaging said interface of said first output shaft and said second transfer assembly engaging said interface of said second output shaft such that rotational motion is transferred and redirected between said first output shaft and said first transfer assembly and said second output shaft and said second transfer assembly;

said transfer assemblies each including a gear train adapted to change the ratio of speed between said transfer assembly and said output shafts to either speed up or slow down the rotation transferred therebetween;

C) a torque difference source positioned between and interconnection said first and second transfer assemblies, said torque difference source including an inner rotor, an outer rotor, and a plurality of vanes positioned therebetween, said outer rotor engaging said first transfer assembly such that rotational motion is transferred between said first output shaft and said outer rotor through said first transfer assembly, said inner rotor engaging said second transfer assembly such that rotational motion is transferred between said second output shaft and said inner rotor through said second transfer assembly,

a power source adapted to pump hydraulic fluid between said inner and outer rotors, thereby inducing drag between said inner and outer rotors;

at least two sensors, said sensors being adapted to measure the difference in rotational speed of said first and second output shafts and thereby the relative power output of said first and second output shafts; and

an electronic controller adapted to receive a signal from said sensors and to selectively actuate said power source to provide hydraulic fluid between said inner and outer rotors.

33. (New): The torque controller of claim 32 wherein said sensors are positioned to directly measure the rotational speed of said first and second output shafts.

c1 34. (New): The torque controller of claim 32 wherein said sensors are positioned to measure the rotational speeds of said inner and outer rotors, said controller being adapted to calculate the relative rotational speeds of said output shafts from the rotational speeds of said inner and outer rotors.
